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Serial No:	09/773,245	Examiner:	Ian N Moore
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For: Handling of Circuit-Switched Data Services in IP-Based GSM Networks

Mail Stop AMENDMENT
Commissioner for Patents
P.O. Box 1450
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Date: January 16, 2006

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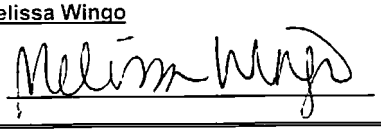
Signature: 

Dear Examiner:

REPLY UNDER 37 C.F.R §1.111

In response to the Office Action of November 16, 2005, the Applicants (or collectively "the Applicant") submit the following amendments and remarks.

Claims 42-43, 51, 60 and 70 have been amended and the claim listing begins on page 2 of this paper.

Remarks/Arguments begin on page 11 of this paper.

Response to Arguments begins on page 15 of this paper.

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1 -41. (Canceled)

42. (Currently Amended) A method for data transmission between a circuit switched network, via an interface means that includes a media gateway, and a packet switched network, the method comprising:

coupling the circuit switched network to the packet switched network with the interface means, the interface means further comprising

a first network layer for transporting only signaling information assigned to a call and

a second network layer for transporting only payload information assigned to a call, wherein the two network layers in the circuit switched network are used for carrying the data transmission, via the interface means, between the circuit switched network and the packet switched network;

processing the signaling information associated with the data transmission in the circuit switched network on [[a]] the first network layer of the two network layers, wherein the first network layer includes a mobile service switching center;

transferring the payload information associated with the data transmission on [[a]] the second network layer of the two network layers in the circuit switched network utilizing a protocol stack, the protocol stack comprising:

a first protocol stack in a mobile station, the first protocol stack coupled to

a second protocol stack in a radio network means, the second protocol stack being coupled to

a third protocol stack in the media gateway; and

information frame generating means for generating an information frame containing payload information associated with the data transmission; and

responsive to detecting a received, empty information frame ~~lacking payload information~~, a first discontinuous transmission (DTX) means in the second protocol stack discarding the received information frame to improve the data rate, wherein remaining information frames are forwarded to the packet switched network via a direct connection between the radio network means and the media gateway.

43. (Currently Amended) The method of claim 42, wherein the circuit switched network is a cellular telephone network, the radio network means is a Base Transceiver Station (BTS), the packet switched network is the Internet, and the second layer of the two network layers further comprises

a number of base stations, each base station connected directly to the interface means for payload exchanges in the second layer and

information frame generating means for generating an information frame with a receive sequence number.

44. (Previously Presented) The method of claim 42, wherein the circuit switched network is a GSM cellular telephone network.

45. (Previously Presented) The method of claim 43, further comprising the step of adapting a transfer rate of the payload information within the BTS.

46. (Previously Presented) The method of claim 42, further comprising the step of disabling a second DTX means in the third protocol stack.

47. (Previously Presented) The method of claim 43, further comprising generating information frames containing payload information in the first protocol stack.

48. (Previously Presented) The method of claim 47, further comprising the step of monitoring the generated information frames for determining whether the generated information frames contain payload information.

49. (Previously Presented) The method of claim 48, wherein the step of monitoring the generated information frames further comprises the step of detecting an "S" frame, which carries supervisory information, and if the "S" frame receive sequence number is equal to that of a previous frame, discarding the "S" frame.

50. (Previously Presented) The method of claim 48, further comprising the step of monitoring the generated information frames in the second protocol stack.

51. (Currently Amended) A method for data transmission from a packet switched network, via an interface means that includes a media gateway, to a circuit switched network, the method comprising:

coupling the packet switched network to the circuit switched network with the interface means, wherein two network layers in the circuit switched network are used for carrying the data transmission via the interface means between the packet switched network and the circuit switched network, the network layers including

a first layer for transporting only payload information assigned to a call and

a second layer for transporting only signaling information assigned to the call;

receiving the data transmission from the packet switched network in the media gateway;

processing signaling information associated with the data transmission in the circuit switched network on [[a]] the first network layer of the two network layers;

transferring payload information associated with the data transmission *in* the circuit switched network on [[a]] the second layer of the two network layers, wherein the second layer comprises a number of base stations directly connected to the interface means and utilizing a protocol stack, the protocol stack comprising:

a first protocol stack in the media gateway, the first protocol stack coupled to

a second protocol stack in a radio network means, the second protocol stack coupled to

a third protocol stack in a mobile station; and

information frame generating means for generating an information frame containing the payload information of the data transmission; and

responsive to detecting a received, empty information frame ~~lacking payload information~~, a discontinuous transmission (DTX) means in the first protocol stack discarding the received empty information frame to improve the data rate, wherein remaining information frames are forwarded to the mobile station via [[a]] the direct connection between the media gateway and the radio network means.

52. (Previously Presented) The method of claim 51, wherein the circuit switched network is a cellular telephone network, the radio network means is a Base Transceiver Station (BTS), the packet switched network is the Internet, and the second layer of the two network layers further comprises information frame generating means for generating an information frame with a receive sequence number.

53. (Previously Presented) The method of claim 51, wherein the circuit switched network is a GSM cellular telephone network.

54. (Previously Presented) The method of claim 52, further comprising the step of adapting a transfer rate of the payload information within the BTS.

55. (Previously Presented) The method of claim 51, further comprising the step of disabling a second DTX means in the second protocol stack.

56. (Previously Presented) The method of claim 52, further comprising the step of generating information frames, containing payload information, in the first protocol stack.

57. (Previously Presented) The method of claim 56, further comprising the step of monitoring the generated information frames for determining whether the generated information frames contain payload information.

58. (Previously Presented) The method of claim 57, further comprising the step of monitoring the generated information frames in the first protocol stack.

59. (Previously Presented) The method of claim 57, wherein the step of monitoring the generated information frames further comprises the step of detecting an "S" frame, which carries supervisory information, and if the "S" frame receive sequence number is equal to that of a previous frame, discarding the "S" frame.

60. (Currently Amended) A communication network element for data transmission from a circuit switched network via an interface means that includes a media gateway to a packet switched network, the network element comprising:

a first network layer, including a mobile service switching center, in the circuit switched network connected to the interface means for transporting and processing only signaling information associated with the data transmission;

a second network layer in the circuit switched network connected to the interface means for transferring only payload information associated with the data transmission, the second network layer utilizing a protocol stack, the protocol stack comprising:

a first protocol stack in a mobile station, the first protocol stack coupled to

a second protocol stack in a radio network means, the second protocol stack being coupled to

a third protocol stack in the media gateway;

means for generating information frames containing the payload information received from the circuit switched network; and

a first discontinuous transmission (DTX) means in the second protocol stack for discarding an empty information frame ~~lacking payload information~~ to improve the data rate, wherein remaining information frames are forwarded on to the packet switched

network via a direct connection between the media gateway and the radio network means wherein the radio network means comprises a number of base stations .

61. (Previously Presented) The communication network element of claim 60, further comprising means in the second protocol stack for monitoring the generated information frames.

62. (Previously Presented) The communication network element of claim 60, wherein the circuit switched network is a cellular telephone network, the radio network means is a Base Transceiver Station (BTS), the packet switched network is the Internet, and the information frame generating further comprises means for generating an information frame with a receive sequence number.

63. (Previously Presented) The communication network element of claim 60, wherein the circuit switched network is a GSM cellular telephone network.

64. (Previously Presented) The communication network element of claim 62, further comprising means for adapting a transfer rate of the payload information within the BTS.

65. (Previously Presented) The communication network element of claim 60, further comprising means for disabling a second DTX means in the third protocol stack.

66. (Previously Presented) The communication network element of claim 60, further comprising means in the first protocol stack for generating information frames containing payload information.

67. (Previously Presented) The communication network element of claim 66, further comprising means for monitoring the generated information frames for determining whether the generated information frames contain payload information.

68. (Previously Presented) The communication network element of claim 67, further comprising means for monitoring the generated information frames in the second protocol stack.

69. (Previously Presented) The communication network element of claim 67, wherein the means for monitoring the generated information frame further comprises means for discarding a detected "S" frame, which carries supervisory information, if the detected "S" frame receive sequence number is equal to that of a previous frame.

70. (Currently Amended) A communication network element for data transmission from a packet switched network via an interface means that includes a media gateway to a circuit switched network, the communication network element comprising:

a first network layer, in the circuit switched network, connected to the interface means for transporting and processing only signaling information associated with the data transmission;

a second network layer, in the circuit switched network, connected to the interface means[[,]] ~~the second network layer~~ and utilizing a protocol stack for transferring only payload information associated with the data transmission, the protocol stack comprising:

a first protocol stack in the media gateway, the first protocol stack being coupled to

a second protocol stack in a radio network means, the second protocol stack being coupled to

a third protocol stack in a mobile station and

information frame generating means for generating an information frame containing the payload information associated with the data transmission; and

a discontinuous transmission (DTX) means in the first protocol stack for discarding a received, empty information frame ~~lacking payload information~~ to improve data transfer rate, wherein remaining information frames are forwarded to the mobile station via a direct connection between the media gateway and the radio network means wherein the radio network means comprises a number of base stations.

71. (Previously Presented) The communication network element of claim 70, wherein the circuit switched network is a cellular telephone network, the radio network means is a Base Transceiver Station (BTS), the packet switched network is the Internet and the information frame generating means further comprises means for generating an information frame with a receive sequence number.

72. (Previously Presented) The communication network element of claim 70, wherein the circuit switched network is a GSM cellular telephone network.

73. (Previously Presented) The communication network element of claim 71, further comprising means for adapting a transfer rate of the data transmission within the BTS.

74. (Previously Presented) The communication network element of claim 70, further comprising means for disabling a second DTX means in the second protocol stack.

75. (Previously Presented) The communication network element of claim 70, further comprising means in the first protocol stack for generating information frames containing the payload information.

76. (Previously Presented) The communication network element of claim 75, further comprising means for monitoring the generated information frames for determining whether the generated information frames contain the payload information.

77. (Previously Presented) The communication network element of claim 76, wherein the means for monitoring the generated information frame further comprises means for discarding a detected "S" frame, which carries supervisory information, if the detected "S" frame receive sequence number is equal to that of a previous frame.

REMARKS/ARGUMENTS

Claim Amendments

The Applicant has amended claims 42-43, 51, 60 and 70. Applicant respectfully submits no new matter has been added. Accordingly, claims 42-77 are pending in the application. Favorable reconsideration of the application is respectfully requested in view of the foregoing amendments and the following remarks.

Claim Rejections – 35 U.S.C. § 103 (a)

Claims 42-48, 51-57, 60-67 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Billstrom (US 5,590,133) in view of Rasanen'006, et al. (US 6,647,006). The Applicant respectfully traverses the rejection of these claims.

The Applicant discloses a method and system for transferring data between a circuit switched and packet switched network. Two network layers are utilized; one layer strictly for transporting signaling information and one layer strictly for transporting payload information. An interface coupled to the two layers, comprising separate functions for handling the signaling and payload transfers, is provided between the circuit switched and packet switched networks. A protocol stack is disclosed that provides individual protocol "sub" stacks in a mobile station (MS), a BTS and a media gateway of the packet network.

The interface comprises a signaling gateway and a media gateway with a first and second layer. The first layer handles only the signaling information between MSC and the "further network" (Fig. 1). The second layer provides a direct connection (Figure 1) between a base station system connected with the media gateway for sending and receiving only call and payload information from the media gateway (page 5, lines 6-35). As noted above, the protocol stack comprises 3 protocol stacks resident on the MS, BTS and media gateway respectively. The protocol stacks on the BTS and media gateway each include a discontinuous transmission layer (DTX) for discarding empty frames in either the uplink or downlink direction. In the uplink direction empty frames are generated in place of no user data from the mobile station (page 19, lines 17-31) and discarded in the BTS (Page 19, lines 10-32) and in the downlink direction

when no data is received from the further network, empty frames are detected and discarded in the Media Gateway (Page 22, lines 5-10). The DTX layer in a base transceiver station (BTS) makes sure that no empty frames are being sent over the uplink to a media gateway when the mobile station is not sending any user data. Similarly, the media gateway DTX layer makes sure that no data is being sent to the mobile station when no data is received from a further network. By discarding these empty frames, the data rate can be improved. (Summary)

The Billstrom reference appears to disclose apparatuses and mobile stations for providing packet data services in TDMA cellular systems (Abstract). Shared packet data channels (PDCH) are an integral part of the Billstrom reference as is the use of Interworking Functions (IWF) for connecting the TDMA network with a "further" or cellular network.

It is well known in the telecommunications art that the term "Interworking" is a term used to define the ability of one technology to communicate, or "Interwork," with another. Network Interworking is the process of tunneling one protocol or technology across another protocol or technology. This process connects two like points across an established tunnel. As noted in Billstrom, an Interworking Function provides interworking with external networks by performing protocol conversion, address translation and routing packet data traffic between cooperating PLMNs (Col. 7, lines 42-48).

It is also well known in the art that a Media Gateway is a function incorporated in a cellular network (typically 2.5G or higher) for performing specific tasks. Typically, a media gateway converts multimedia input and acts as a translation unit between disparate telecommunications networks such as PSTN; Next Generation Networks; 2G, 2.5G and 3G radio access networks or PBX. Media Gateways enable multimedia communications across Next Generation Networks over multiple transport protocols such as ATM and IP.

The Billstrom reference is cited for disclosing processing signaling information on a first network layer. However, Bilstrom, in Figure 1 discloses PACKET DATA (PD) AND RELATED SIGNALLING and CIRCUIT ,,, DATA AND RELATED SIGNALING. In

both instances, payload is transported together with signaling information. The Applicant has amended claim 42 in order to more distinctly claim the limitations regarding the transport of signaling and payload on separate layers. Billstrom does not appear to disclose sending signaling only on a first network layer and sending payload via a direct connection between the base station and the media gateway and only on a second layer to the media gateway. Billstrom in fact, discloses sending both data transfer and the associated control signaling over Packet data channels (PDCH) on a physical TDMA channel (Col. 7, lines 12-18). Further, Billstrom discloses interconnecting MSCs via a backbone network with IWFs, (Col. 7, lines 40-56) which is in direct contrast to the direct connection disclosed in the Applicant's invention.

The Rasanen reference appears to disclose a system for transferring data across an interface for high-speed radio traffic where the total data rates at the radio interface and at the network interface are different. The total data rates of the network interface and the radio interface are rate-adapted by transferring fill data, in addition to payload, in transmission frames between a radio access network element, such as a base station, and the interworking function (IWF). A BTS rate-adapts RLP frames by transmitting meaningless fill data in an E-TRAU frame if no RLP frames are available at the moment of transmission. In other words, Rasanen adds "filled" frames to change data rate (Summary). Also, the frame may be a filled frame or an invalid RLP frame, which is discarded by the receiving RLP unit (Col. 7, lines 40-49)

In the Official Action, the Rasanen reference is cited for teaching a discontinuous transmission means in a second protocol stack in a radio network means (BTS) discarding received information frames. A correspondence is drawn between the DTX of the Applicant's invention and the description of RLP frame manipulation found in Col 7, lines 25-62 of the Rasanen reference. However, the Applicant has reviewed this cited portion of Rasanen and finds no reference to discarding frames. Instead, the cited portion of Rasanen describes the insertion of meaningless fill data in an E-TRAU frame. In contrast to the Rasanen reference, the Applicant's invention removes empty frames. In the uplink direction the empty frames are detected and removed in the BTS and in the downlink direction the empty frames are detected and removed in the media

gateway. Essentially, the Rasanen reference solves a problem of adaptation of different data rates. RLP frames are generated, in the downlink side, with meaningless data and sent to adapt the data rate. Nowhere in the Rasanen reference is disclosed receiving an information frame lacking payload information or an empty frame. Every frame has either an RLP frame or, corrupted or invalid data. Data rates in the Rasanen reference are compared but there is no detection function limitation. In particular, the Applicant's present invention discloses detection being performed prior to generating frames and this limitation is not disclosed in Rasanen.

Rasanen provides an insight to his invention in the Summary. An abbreviated description of the invention is stated: "...[B]asically the method only comprises manipulating the content of the information to be transmitted, and the method is only visible to the base station and the interworking function which insert and discard the fill data." The description is supported throughout the specification including the cited portion.

The interface of the Applicant's invention utilizes a media gateway, not an Interworking function as disclosed in Rasanen. Though the Interworking function in the Rasanen reference is capable of providing some of the same services of a media gateway, the IWF in Rasanen discards frames that were filled with invalid or intentionally corrupted data. This is contrary to the operation of the Applicant's invention, which discards empty frames which have been substituted for the lack of transmission from either the connecting network or the mobile station.

Neither Billstrom nor Rasanen, individually or in combination, teach discarding empty frames, or forwarding information frames via a direct connection between the radio network means (BTS) and the media gateway. Independent claims 51, 60, and 70 are analogous to claim 42 and contain similar limitations. The Applicant respectfully requests the withdrawal of the rejection of claims 42, 51, 60 and 70 and the respective dependent claims.

Claims 49, 50, 58, 59, 68, 69 and 77 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Billstrom in view of Rasanen'006 as applied to claim 41 above,

and further in view of Mallory (US 6,335,933). The Applicant respectfully traverses the rejection of these claims.

The Mallory reference appears to disclose a method for sending frames over an unreliable path. The sender retains a copy of each frame sent to a receiver until all frames are confirmed received as sent. If a frame is not received properly the sender sends a copy of the retained frame. It is respectfully submitted that Mallory does not address the above-identified deficiencies of Billstrom and Rasanen with respect to the Applicant's invention.

The combination of the Billstrom, Rasanen and Mallory references fail to teach the limitations in independent claims 42, 50, 60, and 70; those of discarding frames that lack data or forwarding information frames via a direct connection between the radio network means (BTS) and the media gateway. Claims 49, 50, 58, 59, 68, 69 and 77 contain the same limitations as the respective independent claims. The Applicant respectfully requests withdrawal of the aforementioned rejected dependent claims.

Response to Arguments

In the Response to Arguments section of the present Final Office Action, there are statements made that the Applicant respectfully disagrees with the conclusions reached.

First, the statement " Billstrom discloses information frame generating means (see Fig. 2 and 3, IWF) for generating an information frame containing payload information associated with the data transmission responsive to detecting a received information frame...". (page 13 of the Detailed Action) The Applicant agrees that an IWF may generate a frame, but this particular passage does not disclose the IWF generating an information frame. All the discussion in this passage regarding the IWF is directed towards protocol conversion and address translation; converting and controlling data packets/frames, not generating them. Furthermore, the Applicant has reviewed the entire specification and the general operation of the Billstrom IWF appears to be disclosed in column 7, lines 46-48; "[A]n IWF may perform protocol conversion and address translation, as required. It may also route packet data traffic between

cooperating PLMNs." There is no indication in the specification that Billstrom uses the IWF to generate packets/frames.

Second - again on page 13 - the statement is made that "(...each TCP/IP - frame/packet contains header (i.e. payload information))" (Page 13 of the Detailed Actioni). The Applicant respectfully asserts that a frame or packet header contains control information, not payload information as implied by the statement.

Third, on page 15 of the Detailed action, it is stated that the Applicant argued that "...Rasanen...find no reference to discarding frames (page 12, paragraph 3). The Applicant has again reviewed the cited passages in both Billstrom and Rasanen. Respectfully, the Applicant is still unable to find the discarding reference in either Billstrom or Rasanen. The Applicant respectfully asserts that discarding frames of any type is not found in the cited passages.

Fourth in the discussion regarding empty frames on page 15 of the Detailed Action, the Examiner's contention is that empty frames are not recited in the rejected claims. It appears that a frame that does not contain valid payload information or a frame that contains corrupted information is being considered the same as a frame that is "lacking payload information". Though the Applicant disagrees with the characterization, the Applicant has amended the claims to recite the relied upon feature of "empty" frames. Support for the term "empty" is found the summary and in various locations throughout the specification.

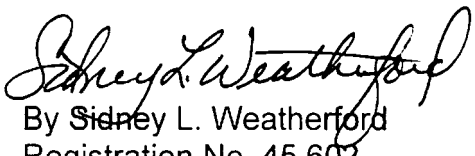
The Applicant respectfully requests the withdrawal of the rejection of claims 42-77.

CONCLUSION

In view of the foregoing remarks, the Applicant believes all of the claims currently pending in the Application to be in a condition for allowance. The Applicant, therefore, respectfully requests that the Examiner withdraw all rejections and issue a Notice of Allowance for all pending claims.

The Applicant requests a telephonic interview if the Examiner has any questions or requires any additional information that would further or expedite the prosecution of the Application.

Respectfully submitted,



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